

Hideaki OHBA\* & Michio WAKABAYASHI\*\*: **Three new species in the section Ciliatae. Notes on the Himalayan *Saxifraga* (2)\*\*\***

大場秀章\*・若林三千男\*\*: ヒマラヤ産ユキノシタ属研究 (2)  
Ciliatae 節の 3 新種

During cytotaxonomical studies of the Himalayan *Saxifraga*, we have encountered with three new species belonging to the series Hirculoideae of the section Ciliatae (=Hirculus). These were collected in the alpine region of the central and east Nepal in 1983 and 1985.

*Saxifraga amabilis* grows on exposed rocks in the higher alpine zones of Rolwaling and Shorong Himal located around the border line of central and east Nepal. This is related to both *S. palpebrata* Hook. f. et Thoms. and *S. cordigera* Hook. f. et Thoms., but differs from those by the sessile (and also never vaginate) narrowly oblanceolate leaves and the erect sepals. With caespitose and gemmiferous nature having flowers with obovate petals of entirely golden yellow and confluent-nerved sepals, this is also distinguished from *S. drabiformis* Franch. This also differs from *S. punctulata* Engl. by the single stem with gemmiferous basal leaf and the obovate petal.

*Saxifraga Harai* is limited in the higher alpine zone between 4450 and 4700 m in altitudes around Dudh Kund and Dudh Kund Glacier in Shorong Himal, east Nepal. This is considered to be a polyploideous derivative of *S. aristulata* Hook. f. et Thoms. The size of the flower and the leaf become magnificently larger than those of that species. This is regarded as diploidized hexaploid species with somatic chromosome number  $2n=6x=48$ , but aneuploid individuals with  $2n=50$  chromosomes are also found (Wakabayashi & Ohba in press). It is, however, hardly recognizable any morphological differences between them.

*Saxifraga Mallae* is strongly related to *S. lepida* H. Smith, but differs from

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it in having shorter sepals with confluent nerves and sessile petals. From *S. chumbiensis* Engl. et Irmsch., this is distinguished by the linear or linear lanceolate, glabrous leaves and maculate petals together with narrowly oblong or broadly lanceolate sepals which are 3 to 4 mm long. This new species well resembles *S. Nakaoi* Kitamura, especially in their smaller habit, but is easily distinguishable from that by the smaller caudine leaves, the sepals (never being ovate at the apex), and the stems without blackish glandular hairs. Two cytotypes are known in this. The plant with  $2n=24$  chromosomes is regarded as allotriploid with different genomic constitution (Wakabayashi & Ohba in press).

***Saxifraga amabilis* H. Ohba et Wakabayashi, sp. nov.**

[Sect. Ciliatae Ser. Hirculoideae] (Fig. 1)

Valde affinis *Saxifragae palpebratae* Hook. f. et Thoms. et *S. cordigerae* Hook. f. et Thoms., sed a quibus foliis anguste oblanceolatis basalis non petiolatis nec vaginatis et sepalis erectis (nec patentibus) statim distincta. Habitu *Saxifragae drabiformi* Franch. similis, sed plantis caespitosis, gemma in axillis basilarium foliorum evoluta, petalis toto aureis (nec purpureis) obovatis et sepalis nervis sub apice confluentibus vene differt. A *S. punctulata* Engl. caulinibus uni (non 2-3)-floris, foliis basi gemmiferis petalis obovatis toto aureis recedit.

Caespitosa, caudiculis brevissimis, caulinibus compluribus suberectis, ex initis supra erectis nec nutantibus, 3-5 cm longis, densiuscule foliatis, infima parte glabris sursum modice multicellularibus rubro-glanduloso-pilosis ornatis, unifloris. Folia alternata, sessilia, utrinque complanata, basi nunquam vaginata, toto

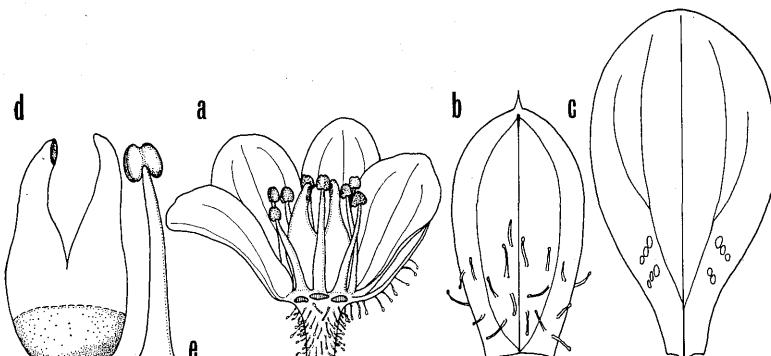


Fig. 1. *Saxifraga amabilis*. a. flower. b. sepal. c. petal. d. ovary. e. filament. a  $\times 6.25$ , others  $\times 12.5$ .

aequimagna vel superne gradatim decrescentia, oblanceolata vel anguste ovata, 4-5 mm longa 1.5-2.2 (-2.5) mm lata, apice acuta vel apiculata, margine pilis longioribus multicellularibus translucentibus saepe glanduliferis sparsissime obsita, basalia (pauxillum caulinis minora) haud rosulata, quaedam emorta longe remanentia. Gemma ad 3 mm longa in basilarium foliorum axillis rufo pilosa evoluta.

Flores hermaphroditici proterandri, erecti. Sepala suberecta, fere libera, oblonga vel oblongi spathulata, 4-5 mm longa 2-2.5 mm lata, apice apiculata vel acuta, dorso marginemque longe multicellularo-glandulosi-pilosa, nervis vulgo 3 sub apice in verruculam confluentibus. Petala aurea, parte inferiore 2- vel 4-maculatis (ipsa macula ex (2- vel) 3-punctulis constans), obovata, apice rotundata, basi in unguem inconspicuo gradatim decrescentia, 5-6.5 mm longa, 3-4 mm lata, per anthesim patentia.

Stamina longitudine petalis ca. 1/3 breviora, filamentis erectis per anthesim, subulatis, 3-3.5 mm longis, luteolis, antheris ante dehiscentem ex roseo subviridibus, ca. 0.7 mm longis. Pistillum statu submaturo (cum stylo) ca. 4 mm longum et 2 mm crassum; ovarium superum, anguste ovoideum, viride, ut videatur parte inferiore annulo nectarifero lato instructum, stylis aetate divaricantibus, ca. 2.5 mm longis, stigmate inprominenter capitato, pallidissime lutescenti. Chromosomatuum numerus  $2n=24$ .

C. Nepal. Rolwaling Khola: Na-Sangma-Khabun, alt. 4300 m (Ohba, Wakabayashi & Akiyama 8320640, TI—Holotype; 8351339, TI); Na-Rinaldung, alt. 4050-4300 m (Ohba, Wakabayashi & Akiyama 8351310, TI). E. Nepal. Sagarmatha Zone. Solukhumbu Distr., below Dudh Kund, alt. 4550 m. By rocks in wet open ground under a water fall (Ohba & Wakabayashi 8531183, TI).

**Saxifraga Harai** H. Ohba et Wakabayashi, sp. nov.

[Sect. Ciliatae Ser. Hirculoideae] (Fig. 2)

Ex affinitate *Saxifragae aristulatae* Hook. f. et Thoms. foliis floribusque majoribus et sepalis margine glandulosi-pilosis statim dignoscenda.

Planta dense caespitosa, ad 2 cm alta, viridis. Caudiculis dense foliatis atque caulinibus floriferis 4-5 cm longis, modice foliatis, pilis rufescentibus crispulis, nonnusquam glanduliferis densiuscule obsitis, unifloris. Folia caudicula ad 2 cm longa, lamina angustissime lineari-spathulata vel lineari-rhombica, 3-8 mm longa vix 1.5 mm lata, rigida, margine pilis glanduliferis multicellularibus sparsissime obsita, inconspicuo recurva, apice acuta (nec aristulata), in petiolum late linearem

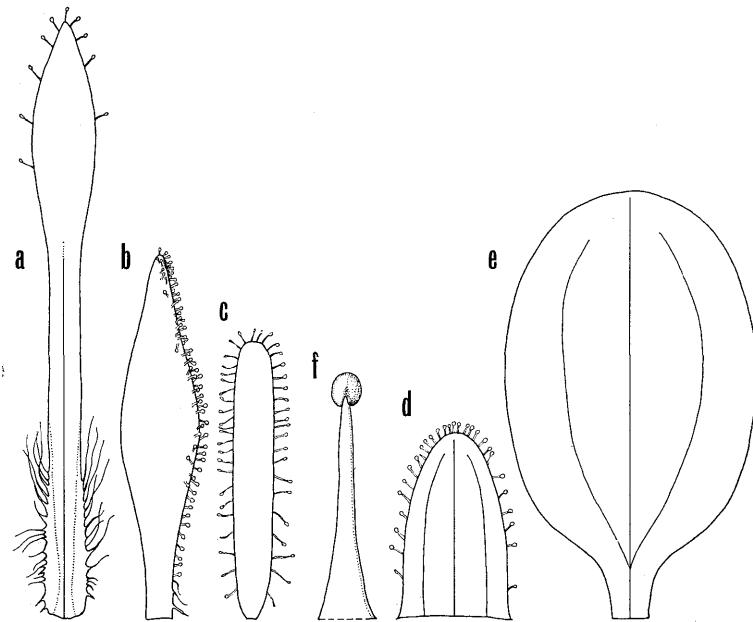


Fig. 2. *Saxifraga Harai*. a. radical leaf. b & c. caudine leaves. d. sepal. e. petal. f. filament with anther. a, b & c,  $\times 6.25$ , others  $\times 12.5$ .

ad ca. 1 mm latum laminam aequilongum vel leviter longiore saepe longe vaginantem et pilis longis rufis instructum transeuntia. Folia caudina suberecta, linearia vel angustissime rhombica, 4-8 mm longa 0.7-1.5 mm lata, sessilia, margine pilis glanduliferis multicellularibus densiuscule obsita, utrinque sparsissime glanduloso-pilosa.

Flores ex initio erect (nec nutantes), hermaphrodit proterandri, hypanthio glanduloso-piloso. Sepala oblongi-ovata, apice rotundata, 3-4 mm longa 2-2.5 mm lata, margine densiuscule glanduloso-pilosa, dorsi prope marginem sparse glanduloso-pilosa, suberecta, viridia; nervis 3 vulgo sub apice confluentibus sed raro liberis. Petala aurea, late oblonga vel oblonga, apice rotundata basi in unguem 0.5 vel 1 mm longum gradatim decrescentia, (cum ungue) 6-8 mm longa 3-5 mm lata, prope basim macula aurantiaca binatim instructa, per anthesim basi suberecta sed supra adscendentia vel interdum patentia, 3-nervia sed nervis lateralibus bifidis itaque 5-nervia.

Stamina longitudine petalorum dimidium paullo superantia; filamentis erectis, luteis, prope 4 mm longis, subulatis, antheris ante dehiscentem saturate aureis, ca. 0.5 mm longis. Pistillum statu submaturo ovoideum, toto viridium, stylis aetate divaricantibus brevioribus, stigmate valde capitato, superum. Chromosomatum numerus  $2n=48$  vel 50.

E. Nepal. Sagarmatha Zone. Solukhumbu Distr.: Beni Kharka-Tschokarma, alt. 4550 m. On mossy rocks.  $2n=50$  (Ohba & Wakabayashi 8520377, TI—Holotype; 8531239, TI); loc. cit., alt. 4700 m. On rocks in sunny place.  $2n=48$  (Ohba & Wakabayashi 8520321, TI); below Dugh Kund—upper Dugh Kund Glacier, alt. 4450–5000 m (Wu 8581211, TI); below Dugh Kund—east of Dankilobug—Dugh Kund, alt. 4650 m.  $2n=48$  (Wakabayashi, Suzuki & Kurosaki 8520353, TI); Beni Kharka—Dikitscho—upper Dugh Kund, alt. 4600 m.  $2n=48$  (W.S. & K. 8520337, TI).

**Saxifraga Mallae** H. Ohba et Wakabayashi, sp. nov.

[Sect. Ciliatae ser. Hirculoideae] (Fig. 3)

*Saxifraga lepida* H. Smith aemulans, sed quem sepalis brevioribus nervis confluentibus et petalis sessilibus nec unguiculatis vene disjungenda. A et *S. nigroglandulosa* Engl. et Irmsch. et *S. Nakaoi* Kitamura foliis caulinis minoribus sepalis anguste oblongis vel late lanceolatis nec ovatis et caulinis sine pilis densis longis nigris glanuligeris aperte differt. Habitu *S. chumbiensi* Engl. et Irmsch. versimilis, sed foliis basalibus caulinisque glabris (non pilosis) linearibus vel lineari-lanceolatis nec spathulatis nec lanceolatis et sepalis anguste oblongis vel late lanceolatis nec ovatis, 3–4 nec 5.5 mm longis petalis maculatis differt.

Caespitosa caules erectos gracilimos 3–5-foliatos infima parte glabros sursum sat dense brevissime glanduloso-pilosos, vulgo in axillis rufo-pilosos, 3–8 cm altos unifloros edens. Folia basalia 1–2.5 cm longa, gemmifera; lamina linearia vel lineari-lanceolata, 0.6–2 mm lata, toto glabra, margine vulgo glabra vel raro grosse ciliata, basi in petiolum sensim angustata; petiolo lamina vulgo aequanti vel longiore, margine sparsissime ciliato; caulinis linearia apice obtusa, infima longe petiolata et grandia, supra sessilia, sursum decrescentia, basi ex attenuato truncata transientia.

Flores subdioici, hypanthio sparsissime glanduloso-piloso vel saepe glabratu, pilis brevissimis ca. 0.4 mm longis translucentibus glandulis nigris terminalibus. Sepala anguste oblonga vel late lanceolata, apice obtusa, 3–4 mm longa 1–2 mm lata, patentia in anthesi, glabra sed raro margine nigro glanduloso-pilosa,

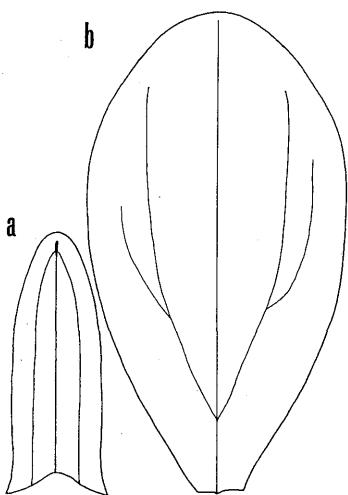


Fig. 3. *Saxifraga Mallae*. a. sepal. b. petal.  
All  $\times 12.5$ .

centibus; in flore subfemineo filamentis ca. 1-1.5 mm longis antheris deminutis ca. 0.5 mm longis, polline parentibus. Pistillum statu submaturo (cum stylo) 6-7 mm longum et ca. 4 mm crassum; ovario basi 1/5 connato, ovoides, ex viride sanguineo, stylis brevibus aetate divaricantibus, stigmate robusto obliquo. Chromosomatum numerus  $2n=16$  vel 24.

C. Nepal. Janakpur Zone, Ramechhap Distr. : Neju-above Luk Kharka (west slope of Zurmoche Glacier), alt. 4500 m (H. Ohba 8530649, TI—Holotype); around Thare Og, alt. 4150 m.  $2n=16$  (Ohba, Kikuchi, Wakabayashi, Suzuki, Kurosaki, Rajbhandari & Wu 8520188, TI); loc. cit., alt. 4550 m.  $2n=16$  (O.K.W.S.K.R. & W. 8520198, TI); Thare Og-Bigphera Lho Glacier, alt. 4150-5000 m (Ohba, Kikuchi & Rajbhandari 8530485, TI); loc. cit. (O.K.W.S.K. & W. 8530566, TI) Rolwaling Khola. Na-Sangma-Khabun, alt. 4050-4400 m,  $2n=16$  (Ohba, Wakabayashi & Akiyama 8320643, TI).

E. Nepal. Sagarmatha Zone. Solukhumbu Distr. : Beni Kharka-Dikitscho-below Dudh Kund, alt. 3970-4450 m. On mossy rock (Ohba, Rajbhandari & Wu 8531117, TI); loc. cit. alt. 4600 m.  $2n=24$  (Wakabayashi, Suzuki & Kurosaki 8520340, TI); loc. cit. alt. 4600 m.  $2n=24$  (W.S. & K. 8520338, TI); below Dudh Kund-east of Dankilobug, alt. 4650 m.  $2n=16$  (Wakabayashi, Suzuki & Kuro-

nervis 3 sub apice confluentibus, lateralibus nonnunquam bifidis. Petala aurea obovata vel late anguste obovata, apice rotundata basi cuneata vel attenuata, sessilia, adscendentia per anthesim, 7-9 mm longa 4-5 mm lata, partibus duabus tertiiis inferioribus multo maculata vel rarissime emaculata, macula ipsa lutea minute circulare, nervis 3 liberis, lateralibus saepe bifidis.

Stamina in flore submasculo longitudine petalis duplo breviora, filamentis subulatis 3-4 mm longis luteis adscendentibus per anthesim, antheris ante dehiscentem saturate auratis ca. 0.7 mm longis, pollen produ-

saki 8520352, TI); around Dudh Kund, alt. 4500 m (O. W. S. K. R. & W. 8531157, TI); below Dudh Kund-Beni Kharka, alt. 4000-4500 m (Ohba & Wu 8581225, TI); below Dudh Kund-upper Dudh Kund Glacier, alt. 4450-5000 m (Wu 8581221, TI); below Dudh Kund-Thaladarbug-Chatoa-Beni Kharka, alt. 4500 m.  $2n=24$  (Wakabayashi, Suzuki & Kurosaki 8520362, TI).

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#### Reference

Wakabayashi, M. & H. Ohba (in press). Cytotaxonomic studies of the Himalayan *Saxifraga*. In: H. Ohba & S. B. Malla (ed.), Studies of Himalayan plants, vol. 1.

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ユキノシタ属はヒマラヤ高山帯で最も多様化した属であり、同高山帯における多様性解析のモデルケースとして本属の細胞遺伝学的研究を行った。その結果は別の論文にまとめたが、研究の過程で Ciliatae 節 Hirculoideae 系に属する 3 つの新植物が見いだされたので記載した。*Saxifraga amabilis* は、高山帯の岩上を覆う小形の植物で *S. palpebrata* や *S. cordigera* に近縁である。*Saxifraga Harai* は *S. aristulata* に近縁で、細胞遺伝学的には  $2n=48$  の染色体をもつ 6 倍体であるが、 $2n=50$  という異数体も見いだされている。*Saxifraga Malla* にも  $2n=16$  の染色体をもつ 2 倍体と  $2n=24$  の 3 倍体があることが判明したが、両倍数体間には分類学的に区別を必要とする形態上の差異は見いだせなかった。

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□林 弥栄・畔上能力・菱山忠三郎・西山尚道：春の山野草と樹木 512 種（マイフルーレ・シリーズ）253 pp. 1987. 講談社、東京. ￥2,200. B5 幅広判の各ページに似た種類の接写写真 2~3 を並べて簡単な説明を与え、隣に見分け方の要点をわかりやすい線面で図解している。植物に詳しく長年観察会を指導してきた 4 氏の監修だけあって、種類や写真の選定も図解も要領を得ている。初心者にもよくわかり研究者にも参考になる美しく便利な本になっている。食虫植物・食用野草・毒草・薬草の特集と、植物名・街路樹・野外観察案内などの記事もある。この春の巻に続いて夏の巻と秋の巻も刊行される予定だという。

(伊藤 洋)